CLAIMS

1. A positive resist composition, comprising:

a base resin component (A), which contains acid dissociable, dissolution inhibiting groups and exhibits increased alkali solubility under action of acid; and

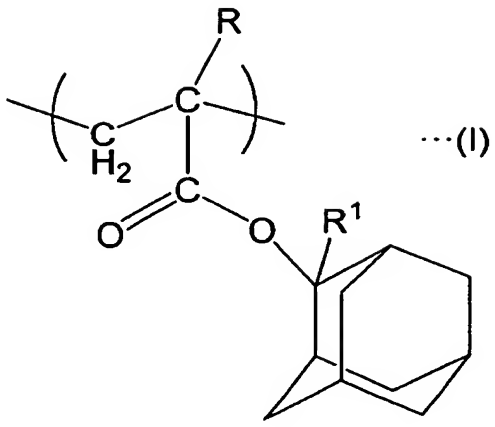
an acid generator component (B) that generates acid on irradiation, wherein

said component (A) is a copolymer comprising structural units (a-1), which are derived from an (α-lower alkyl) acrylate ester that contains an acid dissociable, dissolution inhibiting group, and also contains an aliphatic cyclic group, structural units (a-2), which are derived from an (α-lower alkyl) acrylate ester that contain a γ-butyrolactone residue, and structural units (a-3), which are derived from an (α-lower alkyl) acrylate ester that contains a hydroxyl group-containing aliphatic polycyclic hydrocarbon group, and a glass transition temperature (Tg) of said copolymer is within a range from 100 to 170°C.

2. A positive resist composition according to claim 1, wherein a weight average molecular weight of said component (A) is within a range from 4,000 to 8,000.

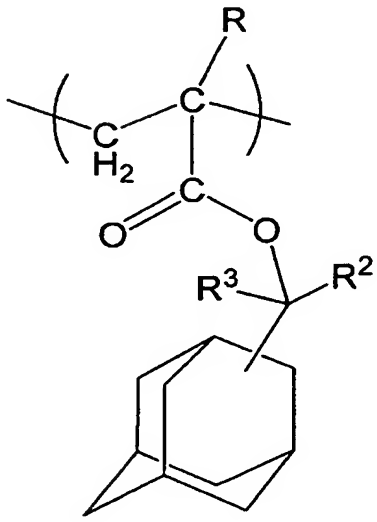
3. A positive resist composition according to claim 1, wherein said acid dissociable, dissolution inhibiting group is a tertiary alkyl group.

4. A positive resist composition according to claim 3, wherein said structural unit (a-1) is one or more units selected from the group consisting of structural units represented by general formulas (I), (II), and (III) shown below:



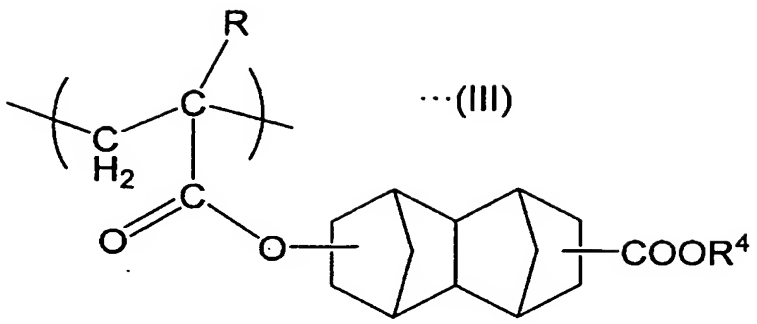
···(I)

(wherein, R represents a hydrogen atom or a lower alkyl group, and R^1 represents a lower alkyl group),



···(II)

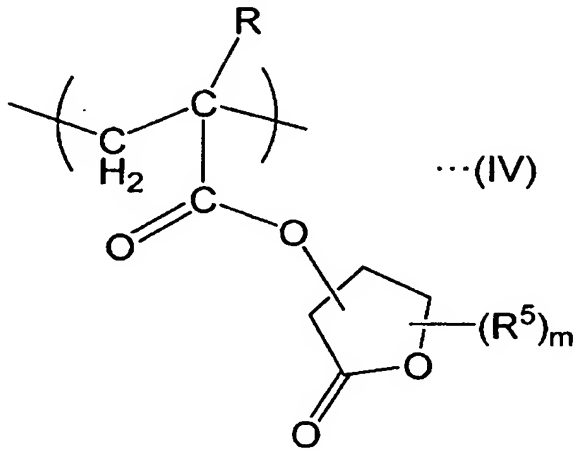
(wherein, R represents a hydrogen atom or a lower alkyl group, and R^2 and R^3 each represent, independently, a lower alkyl group),



···(III)

(wherein, R represents a hydrogen atom or a lower alkyl group, and R^4 represents a tertiary alkyl group).

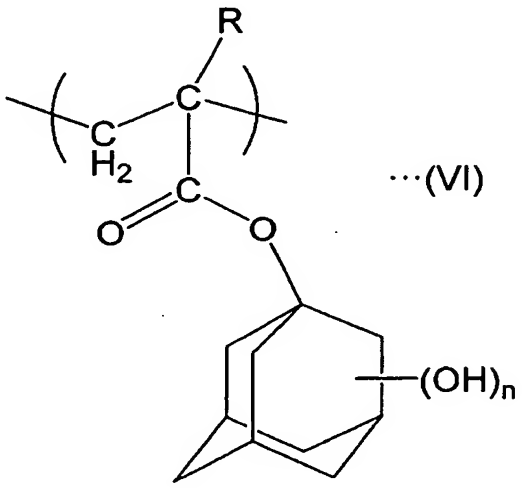
5. A positive resist composition according to claim 1, wherein said structural unit (a-2) is one or more units selected from the group consisting of structural units represented by a general formula (IV) shown below:



···(IV)

(wherein, R represents a hydrogen atom or a lower alkyl group, R^5 represents a hydrogen atom or a lower alkyl group, and m represents an integer from 1 to 4).

6. A positive resist composition according to claim 1, wherein said structural unit (a-3) is one or more units selected from the group consisting of structural units represented by a general formula (VI) shown below:



...(VI)

(wherein, R represents a hydrogen atom or a lower alkyl group, and n represents an integer from 1 to 3).

7. A positive resist composition according to claim 1, wherein a proportion of said structural unit (a-1) relative to a combined total of all structural units of said component (A) is within a range from 20 to 60 mol%.

8. A positive resist composition according to claim 1, wherein a proportion of said structural unit (a-2) relative to a combined total of all structural units of said component (A) is within a range from 20 to 60 mol%.

9. A positive resist composition according to claim 1, wherein a proportion of said structural unit (a-3) relative to a combined total of all structural units of said component (A) is within a range from 1 to 30 mol%.

10. A positive resist composition according to claim 1, further comprising: a nitrogen-containing organic compound (C) in a quantity equivalent to 0.01 to 5% by weight relative to said component (A).

11. A method for forming a resist pattern using a lithography process comprising the steps of:

applying a chemically amplified positive resist composition to a substrate to provide a resist film;

conducting selective exposure of said resist film;

performing post exposure baking (PEB); and then

conducting alkali developing, wherein

line and space patterns are first formed at a plurality of preliminary PEB temperatures using said lithography process, a relationship between a size of a space pattern formed and a preliminary PEB temperature at which said size is formed is plotted in a graph with size of said formed space pattern along a vertical axis and said preliminary PEB temperature along a horizontal axis, a preliminary PEB temperature corresponding with a point at which said size reaches a maximum value in said graph is set as an optimum PEB temperature, and a PEB temperature within said lithography process is set to a temperature within ±2°C of said optimum PEB temperature.

12. A method for forming a resist pattern according to claim 11, wherein a positive resist composition according to any one of claims 1 through 10 is used as said chemically amplified positive resist composition.